

Three new Victorian species related to *Eucalyptus aromaphloia* L.D.Pryor & J.H.Willis and notes on the polymorphic nature of that species

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ABSTRACT

Eucalyptus fulgens from West Gippsland, *Eucalyptus sabulosa* from the Wimmera region (including the Grampian Ranges) and *Eucalyptus splendens* from the Portland area in south-western Victoria are described and comments regarding the affinities, distribution and conservation status of each are given. Of the new taxa *Eucalyptus splendens* has a very restricted distribution and has been assigned a specific code regarding its conservation status. The polymorphic nature of *Eucalyptus aromaphloia* is also discussed in the accompanying notes and several morphological forms within that species are identified.

Introduction

Populations of smallish, rough-barked trees with seven-flowered inflorescences, scarred buds (the outer operculum is shed early in bud development) and smallish, sub-globular fruits, namely forms of *Eucalyptus viminalis* Labill., *E. cephalocarpa* Blakely and *E. aromaphloia* L.D.Pryor & J.H.Willis, are common in south-eastern Australia, particularly throughout southern Victoria. These have been sources of considerable confusion to observers of *Eucalyptus* at many levels. Despite such adult convergence, each group is markedly distinctive in its seedling characters. The juvenile leaves of *E. viminalis* are characteristically green, lanceolate, sessile, amplexicaul and opposite for numerous pairs, those of *E. cephalocarpa* are greyish and copiously waxy, orbicular, sessile, amplexicaul and opposite and the juvenile leaves of *E. aromaphloia* are elliptical, blue-green or grey-green, disjunct and usually shortly petiolate.

Even more confusing, however, is the level of diversity of forms traditionally included under *E. aromaphloia*. Such diversity, in most cases, is subtle to the extent that the segregation of the many different entities depends largely on differences in pre-adult characters. This study has been concerned with resolving taxonomic problems within the complex through the use of seedling trials. The value of such investigations cannot be underestimated as, too often, differences in seedlings are not always apparent in the field. Most certainly, such differences are rarely available in herbaria specimens due to the lack of seedling materials (see Table 1).

The description of *E. aromaphloia* by Pryor and Willis (1954) was the first attempt to resolve the problem of these smallish, rough-barked trees. Its distinctive features were given as alternate, glaucous, elliptical or ovate, sessile or sub-sessile juvenile leaves and a markedly aromatic bark. The distribution was given as central and western Victoria and lower south-east South Australia. The authors also suggested that populations occurring in central Gippsland were probably of the new species.

Furthermore, particular note was given to a gradation in juvenile leaf width with broadest widths occurring in the east, for example at Creswick, to narrowest in the west, for example at Stawell.

In 1962 *E. corticosa* L.A.S.Johnson was erected to accommodate populations of a form of *E. aromaphloia* occurring in three markedly disjunct localities on sandy soils rather than heavy, poorly-drained soils, in the case of *E. aromaphloia*. The selected type population was in the vicinity of Rylstone near Sydney and the others were given as occurring near the New South Wales-Victorian border to the south of Eden and

TABLE 1. COMPARISONS OF SEEDLING MORPHOLOGIES OF *EUCALYPTUS AROMAPHLOIA* AND ITS RELATIVES

Character	<i>Eucalyptus aromaphloia</i>	<i>Eucalyptus fulgens</i>	<i>Eucalyptus sabulosa</i>	<i>Eucalyptus splendens</i>	<i>Eucalyptus ignorabilis</i>	<i>Eucalyptus corticosa</i>
Nodes	moderately crowded to relatively sparse	relatively sparse	relatively crowded	moderately crowded	moderately crowded	moderately crowded
Growth tips	waxy	non-waxy	non-waxy	non-waxy	non-waxy	non-waxy
Juvenile leaf colour	dull or rarely sub-lustrous, grey-green or blue-green	dull, pale green or slightly blue-green, becoming sub-lustrous in advanced juvenility in some populations	lustrous green:	lustrous green	dull, grey-green	dull or sub-lustrous, blue-green
Juvenile leaf shape	narrow to broad elliptical or elliptical-ovate (narrow-leaved forms becoming falcate in advanced juvenility) or linear-oblong and markedly falcate	broad-lanceolate, ovate-lanceolate or ovate, becoming falcate in advanced juvenility	linear, markedly falcate	narrow-lanceolate or lanceolate then ovate-lanceolate in advanced juvenility, non-falcate	lanceolate or ovate-lanceolate, becoming falcate in advanced juvenility	narrow-lanceolate, non-falcate
Juvenile leaf size	3-7 x 0.6-4 cm	4-8 x 1.8-3.5 cm	4-9 x 0.5-1 cm	6-10 x 1-2.2 cm	5-8 x 1.2-2.5 cm	4-8 x 1-1.8 cm
Stem cross-section	round or less often square	round or square	round	square and finely ridged	round	round
Petiole development	sessile for 8-15 pairs in most forms	sessile for 8-10 pairs	sessile for 20 or more pairs	sessile for at least 15 pairs	sessile for 8-12 pairs	sessile for 12-18 pairs
Petiole length	to 5 mm	1 to 1 cm	to 4 mm	to 4 mm	to 6 mm	to 5 mm
Disjunction	in most forms, opposite for 8-15 pairs then irregularly opposite, sub-opposite or alternate for numerous pairs	regularly alternate after 8-10 pairs	variable, but opposite for at least 20 pairs then irregularly opposite, sub-opposite or alternate for numerous pairs	opposite for 10-18 pairs then irregularly sub-opposite or alternate for numerous pairs	opposite for 8-12 pairs then regularly alternate	opposite for 12-18 pairs then regularly alternate

in Victoria's Grampian Ranges in the vicinity of Hall's Gap. Such populations were distinguished from *E. aromaphloia* by their relatively narrow, blue-green juvenile leaves, dullish 'ash-green' or light green adult leaves and appreciably pedicellate fruits (although it was noted by the author that the Grampians populations featured greener foliage and relatively short pedicels). However, Pryor and Johnson (1971) and Willis (1973) recommended that the species be included with *E. aromaphloia* on the basis that its morphology was not consistently separable from that species.

The identity of variable populations of seven-flowered, rough-barked trees in south-west Victoria and south-east South Australia attributed, in part, to *E. aromaphloia* by Pryor and Willis became the subject of considerable controversy. They, and Pryor again in 1955, suggested extensive hybridism involving *E. viminalis* and *E. aromaphloia*. Eventually, *E. viminalis* Labill. subsp. *cygnetensis* Boomsma was described in 1980 and, to a large extent, its treatment eliminated the confusion. Later, Boomsma (1981), in his account of South Australian eucalypts, noted that, despite a thorough search for *E. aromaphloia*, it could not be located in either south-west Victoria or lower south-east South Australia. Further, Chappill and Ladiges (1986), who studied the species and who advanced our understanding of it considerably, supported Boomsma when they found no evidence of intergradation with *E. viminalis* in western Victoria. They too suggested that *E. viminalis* subsp. *cygnetensis* accounted for the extensive occurrence of rough-barked, seven-flowered trees in the region.

In their study Chappill and Ladiges gave evidence to support the resurrection of *E. corticosa* as a species, whose distinctive features were said to include markedly glandular, relatively thin adult leaves (almost twice the density of oil glands found in some Grampians populations that had been included under *E. corticosa* by Johnson), relatively small fruits and non-glaucous, non-falcate, linear-lanceolate juvenile leaves. However, they suggested that it was confined to the type locality near Rylstone. From their evidence they also concluded that *E. aromaphloia* in its original sense contained two additional taxa which could be segregated both morphologically and geographically. Although the distribution of the typical form was given as west-central Victoria, they identified a western form (west of the Grampians Mt. William Range and extending to the centre of the Little Desert) with linear, prominently falcate, sessile, non-glaucous juvenile leaves and with moderately glandular adult leaves and an eastern form (extending from west Gippsland to south-east New South Wales) with broad-lanceolate, petiolate, non-glaucous juveniles. The western form incorporated, in part, the Grampian Ranges segment of Johnson's *E. corticosa* whereas the eastern form included the Eden populations.

E. ignorabilis L.A.S. Johnson and K.D. Hill was described in 1991 to accommodate dull-leaved populations occurring on sandy soils along water courses in central and east Gippsland and in adjacent areas of south-east New South Wales. This new taxon included segments of Chappill and Ladiges' eastern taxon, but not west Gippsland populations with a distinctive lustrous canopy. However, during the course of this study it became apparent that the distribution of *E. ignorabilis* provided by the authors included populations of a form of *E. cephalocarpa* with markedly similar adult features and also with a preference for sandy soils. Despite this, the two are clearly separable in their juvenile leaves with those of *E. ignorabilis* being lanceolate or ovate-lanceolate, alternate and petiolate and those of the other being typical of *E. cephalocarpa*. Differences between the two in bud morphology were also observed, those of *E. ignorabilis* being regularly pedicellate and non-waxy and those of the other taxon being sessile and most often lightly waxy. This study further revealed that *E. ignorabilis* consists of two relatively restricted, markedly disjunct forms. The typical form occurs on extremely elevated sites in shale derivatives in the vicinity of Walhalla, whilst eastern populations occur on sandy soils near water courses in far east Gippsland and adjacent areas of New South Wales.

In summary, the region of Gippsland and adjacent areas of south-east New South Wales contains three species with similar adult features. In addition to the ecotypes of *E. ignorabilis*, there is a form of *E. cephalocarpa* occupying the intervening regions but overlaps with the eastern form of *E. ignorabilis*. *Eucalyptus ignorabilis* does not extend

into west Gippsland beyond the Latrobe Valley, as some Victorian observers have assumed, but is replaced by the closely related, lustrous-leaved third species which favours heavy soils on hilly terrain.

Two other relatives of *E. aromaphloia* are described as new species. The first, which consists of numerous small populations occurring throughout the Wimmera region, represents Chappill and Ladiges' western taxon. The second, which has a very restricted distribution, was overlooked by previous researchers. It occurs near Portland in south-west Victoria and features seedlings with lustrous, juvenile leaves and squared, finely ridged stems.

The study also examined the variable nature of *E. aromaphloia* and a mosaic of subtly different forms has been identified. In the context of this study, all these forms are considered to belong to a single, extremely polymorphic species. In the accompanying notes aspects of their morphologies and their distributions are briefly discussed.

Taxonomy

1. *Eucalyptus fulgens* K.Rule *sp. nov.*

Eucalypto ignorabili L.A.S.Johnson & K.D.Hill affinis, foliis juvenilibus majoribus viridibus pallidis, foliis adultis nitido-viridibus, cortice crassa subfibrosa sulcata profunde differt.

HOLOTYPE: 0.9 km along Red Hill Road from the intersection of Albers and Manestar roads, Upper Beaconsfield, Victoria, 38°02'S, 145°23'E, 20 June 1994, K. Rule 9464 (MEL).

Small, spreading trees to 15 m tall. *Bark* grey-brown, sub-fibrous, often deeply furrowed on trunk and major branches with thick slabs and strips; basal bark with loose, often crusty chunks; minor branches smooth, light brown, with old bark decorticating in short, brownish ribbons. *Seedling leaves* ovate-elliptical, pale green, sub-sessile, decussate. *Juvenile leaves* broad-lanceolate, ovate-lanceolate or ovate, sessile then shortly petiolate by 8-10 nodes and becoming disjunct (sub-opposite for a few pairs then regularly alternate) at the same stage, pale green or slightly blue-green, dull but may become slightly lustrous in advanced juvenility, slightly discolorous, acuminate, glandular, 4-8 x 1.8-3.5 cm; petioles to 10 mm long; venation visible but not conspicuous; growth tips lustrous; nodes relatively sparse; seedling stems square or round in section but non-ridged. *Intermediate leaves* lanceolate or broadly lanceolate, sometimes falcate, longer than juvenile leaves, sub-lustrous or lustrous, green or slightly blue-green, pendulous. *Adult leaves* lanceolate, falcate, lustrous, green, concolorous, glandular with numerous island glands, acuminate, 12-25 x 1.5-3 cm; petioles 1.4-2.5 cm long; venation moderately reticulate; intramarginal veins 1.5-2.5 mm from margin. *Inflorescences* simple, axillary, 7-flowered; peduncles slender, terete, to 1.1 cm long. *Floral buds* ovoid or clavate, scarred, pedicellate, to 6 x 3 mm; pedicels as long as buds; opercula conical, as long as hypanthia; anthers irregularly inflexed, oblong, dehiscing through longitudinal slits; filaments white. *Fruits* sub-globular, pedicellate, to 6 x 5 mm; discs ascending; valves slightly exerted; locules 3 or 4; pedicels 2-4 mm long. *Fertile seeds* black, irregular in shape, slightly flattened, lacunose.

FLOWERING PERIOD

Autumn.

DISTRIBUTION

The populations are sporadic and occur in west Gippsland from the Latrobe Valley to the Yarra Valley (Fig. 1). The preferred habitat is heavy soils of sandstone origin on ridges and slopes. The annual rainfall across the range exceeds 800 mm with a winter maximum.

CONSERVATION STATUS

The region in which *E. fulgens* occurs has been subjected to extensive clearing particularly for dairy farming. Although reduced to sporadic populations, the species is still abundant in some forested areas that have escaped clearing. It is not regarded as endangered.

ASSOCIATED SPECIES

The species generally grows in pure stands may mix with several other species. Included are *E. radiata* Sieber ex DC., *E. consideriana* Maiden, *E. ovata* Labill., *E. pryoriana* L.A.S.Johnson, *E. cephalocarpa* E. *conspicua* L.A.S.Johnson & K.D.Hill, *E. obliqua* L'Herit. and *E. dives* Schauer.

ETYMOLOGY

The specific epithet is derived from Latin and alludes to the lustrous appearance of the adult leaves.

DISCUSSION

Eucalyptus fulgens is a smallish, rough-barked tree with a lustrous, green canopy and buds and fruits similar to other members of group. On the basis of juvenile morphology, Chappill *et al.* (1986) suggested that populations of eastern Victoria, including *E. fulgens*, shared common features with the swamp gums, that is *E. ovata* and others. This position is strongly supported by the early development of distinctly petiolate, regularly alternate, somewhat ovate-shaped juvenile leaves which are features closely resembling those of swamp gums such as *E. ovata*. However, this is not the opinion held here. Its ovoid buds, sub-globular fruits, spongy, sub-fibrous, strongly aromatic, often deeply furrowed, persisting bark and strongly aromatic juvenile leaves are consistent with *E. aromaphloia* and its relatives.

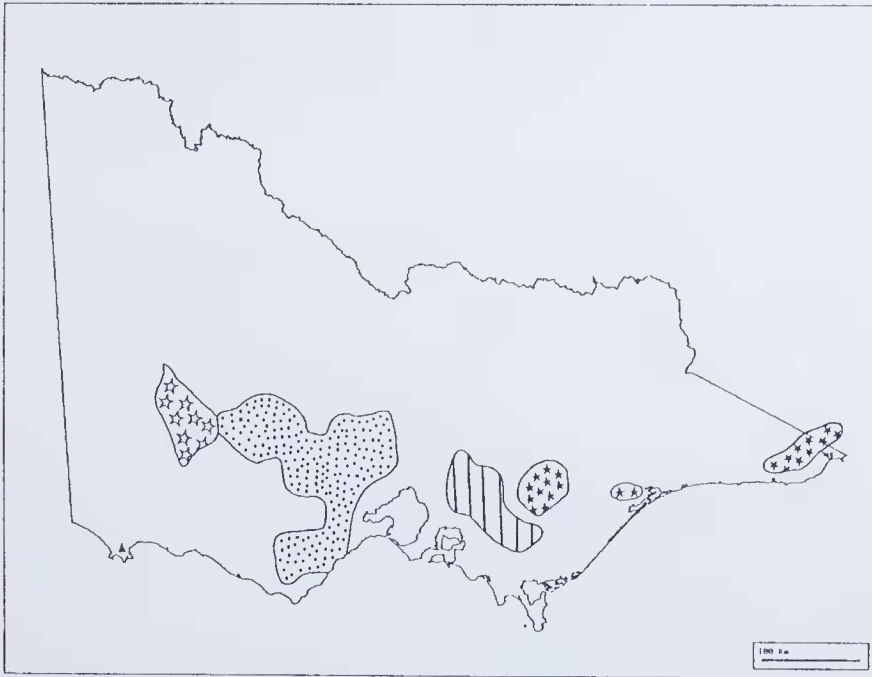


Fig. 1. Distribution of *Eucalyptus fulgens* ☆, *Eucalyptus sabulosa* ☆☆, *Eucalyptus splendens* ▲, *Eucalyptus aromaphloia* ∴, *Eucalyptus ignorabilis* ∴.

The species most closely related to *E. fulgens* is *E. ignorabilis*, the two being inseparable in bud and fruit morphology and occupying ranges adjacent to each other. Even more important is that they possess similar seedling ontogenies and share particular seedling features. Both exhibit relatively early development of alternate, petiolate juvenile leaves and both possess non-glaucous seedling growth tips. In contrast, however, the juveniles of *E. fulgens* are usually larger and are pale green or slightly blue-green rather than grey-green in *E. ignorabilis* (Table 1). Also as the seedlings reach intermediacy, the juvenile leaves of *E. fulgens* become sub-lustrous rather than remaining dull as in *E. ignorabilis*. Eventually, the canopy of *E. fulgens* becomes conspicuously lustrous and green which contrasts markedly with the dull, greyish one of *E. ignorabilis* and, as in the juvenile stage, the adult leaves of *E. fulgens* are usually longer (15-25 cm compared with 10-17 cm long). Lastly, the often deeply furrowed, ragged bark of *E. fulgens* is a marked contrast to the bark of typical *E. ignorabilis* which is thin with fine, longitudinal furrows and peppermint-like in appearance.

There are appreciable differences between *E. aromaphloia* and *E. fulgens* with the former featuring seedlings with waxy growth tips and juvenile leaves that are grey, smaller and generally elliptical to ovate-shaped with shorter petioles throughout juvenility. Furthermore, the rate at which the seedlings of *E. fulgens* develop differs from that of *E. aromaphloia*. Although the juveniles of both become disjunct at approximately the same number of nodes, those of the latter are irregularly opposite, sub-opposite or alternate for numerous pairs (as is the case with the other new species described here). Other subtle differences exist in adult morphology, e.g. although the canopy of *E. aromaphloia* is usually lustrous, it is appreciably blue and its fruits are most often sessile or sub-sessile.

SPECIMENS EXAMINED

VICTORIA: Yarra Junction, 24 Oct. 1954, *N.A. Wakefield* (MEL1608542); Quamby Road, Upper Beaconsfield, 28 June 1964, *J.H. Willis* (MEL1607349); Coranderk Reserve, Picaninny Swamp, Badger Creek via Healesville, 14 May 1973, *J.H. Willis* (MEL514983); Kinglake National Park, 28 July 1982, *A.C. Beaglehole* 70837 (MEL1609456); Warburton Highway, adjacent to the Woori Yallock Plant Nursery, east of Woori Yallock, 20 Oct. 1989, *K. Rule* (MEL1593202); 14 km north of Yarra Glen on the Melba Highway, 2 Oct. 1990, *K. Rule* 9025 (MEL); adjacent to the Lang Lang Golf Course, 7 km from the intersection of the South Gippsland and Bass Highways, 10 Nov. 1990, *K. Rule* 9075 (MEL); 500 m from the Nar Nar Goon turnoff on the Prince's Highway, 1 May 1991, *K. Rule* 9148 (MEL); 8.3 km north of Moe towards Erica, 24 Jan. 1992, *K. Rule* 9218 (MEL); 600 m west of Gumbuya Park on the Prince's Highway, 7 Feb. 1992, *M.I.H. Brooker* 10940 (MEL1616812).

2. *Eucalyptus sabulosa* K.Rule *sp. nov.*

Eucalypto aromaphloiae L.D.Pryor & J.H.Willis affinis, foliis juvenilibus nitido-viridibus sessilibus linearibus falcatis, foliis adultis hebetibus vel sub-nitentibus, pallido-viridibus vel caesio-viridibus differt.

HOLOTYPE: 23 km south of Nhill, Victoria, 36°32'S, 141°40'E, 4 May 1981, *G.C. Cornwall* 340 (MEL641778).

Small, spreading trees to 12 m tall. *Bark* sub-fibrous, somewhat scaly, irregularly furrowed, grey, persisting on trunk and branches. *Seedling leaves* linear, decussate, sessile, blue-green, crowded along the axis but not heath-like. *Juvenile leaves* linear, falcate, sessile for 20 nodes or more then sub-sessile for numerous pairs thereafter, opposite for a similar number of nodes then irregularly opposite, sub-opposite or alternate for numerous pairs thereafter, acuminate, glandular, lustrous and green for numerous pairs (with older leaves becoming sub-lustrous and blue-green), discolorous, 4-9 x 0.5-1.0 cm; venation inconspicuous; growth tips lustrous, green; nodes often crowded but not heath-like; petioles to 4 mm long. *Intermediate leaves* linear-lanceolate or narrowly lanceolate, falcate, sub-lustrous blue-green, alternate, shortly petiolate, larger than juvenile leaves. *Adult leaves* lanceolate, falcate, dull or sub-lustrous, light green or slightly blue-green, glandular, acuminate, to 16 x 2 cm; intramarginal vein not

remote, 1-2 mm from margin; minor venation moderately reticulate, inconspicuous with relatively sparse island oil glands; petioles flattened, to 1.7 cm long. *Inflorescences* simple, axillary, 7-flowered; peduncles slightly angled, to 1.0 cm. *Floral buds* ovoid, shortly pedicellate, scarred to 5 x 3 mm; opercula conical, approximately as long as hypanthia; filaments white; anthers all fertile, irregularly inflexed, versatile, oblong, dehiscing through longitudinal pores. *Fruits* ovoid or sub-globular, sub-sessile, 5-6 x 4-6 mm; valves 3 or 4, slightly exerted; disc ascending; locules 3-4; pedicels 1-3 mm long. *Fertile seeds* black, irregularly shaped, slightly flattened, lacunose.

FLOWERING PERIOD

Autumn.

DISTRIBUTION

Eucalyptus sabulosa occurs throughout the Grampian Ranges, except along the Mt William Range, and extends westwards into the centre of the Little Desert. Populations are small and sporadic and always on sandy soils (Fig. 1)

ASSOCIATED SPECIES

The new species and *E. aromaphloia* overlap on the eastern edge of the Grampians in the Hall's Gap-Pomonal area. In the Grampians and its surrounds, associated species include *E. alaticaulis* Watson & Ladiges, *E. baxteri* (Benth.) Maiden & Blakely, *E. melliodora* A.Cunn. ex Schauer, two forms of *E. gonitocalyx* F.Muell. ex Miq. and *E. obliqua*. In other areas such as the Little Desert, *E. arenacea* Marginson & Ladiges is a common associate whilst *E. leucoxydon* F.Muell. subsp. *stephaniae* K.Rule and various mallee species may occur nearby.

ETYMOLOGY

The specific name is derived from Latin and means 'of the sand' which describes the new species habitat.

CONSERVATION STATUS

Even though *E. sabulosa* occurs in small, sporadic populations, it is a common species and not in danger.

DISCUSSION

The original description of *E. corticosa* emphasised distinctive narrow, blue-green juvenile leaves. Although this description, in part, can be applied to *E. sabulosa*, the two are separable on the basis of other seedling differences. Juvenile leaves of the new species, for example, are sessile for many more pairs and are linear and markedly falcate rather than narrow-lanceolate and non-falcate. There are also differences in adult characters, particularly in adult leaves and fruits, which have been discussed above.

Populations of *E. sabulosa* and *E. aromaphloia* overlap in the vicinity of Hall's Gap and Pomonal but are readily separable in the field on the basis of canopy lustre and juvenile leaf colour. Field studies and seedling trials have indicated hybridism between the two in this area. West of Hall's Gap, starting in the Scrra Range, populations of *E. sabulosa* show no influence of *E. aromaphloia*.

Whereas the adult leaves of *E. sabulosa* are dull or sub-lustrous, light green or slightly blue-green and sparse in oil glands, those of *E. aromaphloia*, in contrast, are more lustrous, exhibit a strong bluish tinge and are appreciably glandular. *Eucalyptus sabulosa* also differs from *E. aromaphloia* whose seedlings have waxy new growth and juvenile leaves that dull and grey, always broader and non-falcate and are opposite and sessile for fewer pairs (Table 1). Lastly, the two species have different habitats. *Eucalyptus aromaphloia* is usually found in heavier, poorly drained soils, in contrast to the preferred sandy soils of *E. sabulosa*. However, populations of *E. aromaphloia* occur in the Black Range near Stawell occur on granite derived soils. In most respects these are consistent with other populations of that species.

Although their respective seedling morphologies and ontogenies differ, *E. sabulosa* and *E. aromaphloia* are considered to be closely related. Their adjacent geographical positions and similarities in the adult features of bark, fruits and buds, support this proposition.

SPECIMENS EXAMINED

VICTORIA: Little Desert, 3 miles [4.8 km] west of Dimboola, 20 Sep. 1948, *J.H. Willis* (MEL706601); Little Desert at Huff's Swamp, 11 Sep. 1949, *J.H. Willis*, (MEL1607347); Road between the Chimney Pots and Billywing, Victoria Range, along the western foot of the range, 23 Feb. 1957, *M. McGarvie, P.E. Finck and A.C. Beaglehole 4082* (MEL); Teddy Bear's Gap, Serra Range, Grampians, 19 Nov. 1961, *N.A. Wakefield*, (MEL1610753; 6 miles [9.6 km] south of Moora Reservoir between Serra and Victoria Ranges, Grampians, 19 Nov. 1961, *N.A. Wakefield* (MEL1610749); Mt Rosea Summit, 16 Mar. 1968, *A.C. Beaglehole 24952* (MEL); Lake Wartook, southern side, 30 June 1972, *A.C. Beaglehole 38386* (MEL); 20 km south-east of Nhill, northern end of Little Desert National Park, 4 May 1981, *G.C. Cornwall 365* (MEL); Victoria Range, beside Old Billywing Track, on western side of range, 6 Apr. 1985, *M.G. Corrick 9430*, (MEL); Adjacent to the Dunkeld Golf Course, 5 km NNW of Dunkeld, 6 Sep. 1988, *D. Frood 022/88* (MEL).

3. *Eucalyptus splendens* K.Rule *sp. nov.*

Eucalypto aromaphloiae L.D.Pryor & J.H.Willis affinis, foliis juvenilibus nitido-viridibus lanceolatis vel ovato-lanceolatis, caulibus plantularum cristatis subtiliter, valvis fructuum exsertis differt.

HOLOTYPE: On the eastern perimeter of the Mt Richmond settlement, Portland-Nelson Rd. 38°12'S, 141°20'E, 29 Sep. 1992, *K. Rule 9272* (MEL).

Small, spreading trees to 10 m tall. *Bark* sub-fibrous, grey-brown, irregularly fissured, persistent throughout; light brown, smooth on branches, decorticating in short strips. Seedling leaves narrow-elliptical, decussate, sessile, pale green. *Juvenile leaves* narrow-lanceolate, lanceolate, becoming ovate-lanceolate in advanced juvenility, sessile then shortly petiolate approximately after 15 nodes, discolorous, lustrous green above and light green below, maturing to blue-green, glandular, acuminate, becoming disjunct (irregularly opposite, sub-opposite or alternate) between 10 and 18 nodes, 4-7 x 1-2 cm; growth tips lustrous; venation inconspicuous; stems square in section, finely ridged; nodes usually moderately crowded. Intermediate leaves ovate-lanceolate or ovate, shortly petiolate, lustrous, blue-green, concolorous. *Adult leaves* lanceolate, sub-lustrous or lustrous, slightly blue-green, glandular, 12-20 x 1.5-2.2 cm; oil glands separate from veins; venation moderately reticulate; intramarginal veins 1-2 mm from margin; petioles slightly flattened, 1.5-2 cm long. *Inflorescences* simple, axillary, 7-flowered. *Peduncles* angled, slightly terete, 6-10 mm long. *Floral buds* ovoid, scarred, shortly petiolate, 4-6 x 3-4 mm; opercula conical or obtuse-conical, as long as hypanthia; stamens all fertile, irregularly inflexed; filaments white; anthers versatile, oblong, dehiscing through longitudinal pores. *Fruits* ovoid or sub-globular, sub-sessile, 5-6 x 4-6 mm; discs ascending; valves often prominently exerted; locules 3 or 4; pedicels 1-2 mm long. *Fertile seeds* black, irregularly shaped, slightly flattened, lacunose.

DISTRIBUTION

Eucalyptus splendens is known only from a single locality to the north west of Portland in Western Victoria between Mt Richmond settlement and Mt Richmond (Fig. 1). It grows on heavy soils of volcanic origin. The distribution which covers a linear distance of approximately 8 km and which contains several large remnants occurs along a narrow sub-coastal, seasonally water-logged belt within a few kilometres of the ocean.

ASSOCIATED SPECIES

Eucalyptus splendens, often an abundant species, occurs in pure stands or in association with *Eucalyptus willisii* subsp. *willisii* Ladiges, Humphreys & Brooker, *Eucalyptus kitsoniana* Maiden and a large-fruited form of *Eucalyptus ovata*, *Eucalyptus baxteri*, *Eucalyptus obliqua* and *Eucalyptus viminalis* subsp. *cygnetensis* also occur in the vicinity but have no contact with this new species.

CONSERVATION STATUS

Eucalyptus splendens is a species of restricted distribution. It occurs within protected reserves, at the roadside along the Nelson-Portland Road and exists in remnants on adjacent farms where substantial numbers have been lost. In accordance with criteria of Briggs and Leigh (1989) a code of 2E is suggested for this species.

ETYMOLOGY

The specific name is derived from Latin and alludes to the lustrous juvenile leaves.

DISCUSSION

Considerable credit for knowledge of *Eucalyptus splendens* must be given to Mr. Cliff Beaglehole of Portland who had been aware of the species existence for many decades. It was through his persistence that this treatment eventuated. In 1989 Mr. Beaglehole sent me specimens, including seedlots, and seedling trials confirmed his assertion that the Portland scent barks not only were true-breeding but represented an undescribed taxon.

Known to local observers as 'Apple Jack', *Eucalyptus splendens* appears to have been confused with *E. viminalis* subsp. *cygnetensis*, another seven-flowered, rough-barked tree present in south-west Victoria. Both taxa are similar in adult morphology but are readily separable in the seedling stage. Whereas *E. viminalis* and its subspecies have persisting decussate juveniles, those of *E. splendens* become irregularly spiralled along the axis and show considerably earlier disjunction. Further, the juveniles of the new species have tapered rather than amplexicaul bases and approach an ovate shape in advanced juvenility rather than remaining lanceolate. Further, as is evident in the field, the fruits of *E. splendens*, with their raised discs and exerted valves, are inconsistent with the manna gums.

Whilst the rate at which the juvenile leaves of *E. splendens* become disjunct and petiolate corresponds with that of *E. aromaphloia*, it possesses a suite of seedling features inconsistent with that species. For example, the lanceolate, lustrous and light green juveniles, the non-waxy growth tips and the squared, ridged stems are distinctive. Further, the fruits of *E. splendens*, as described above, are not consistent with *E. aromaphloia*.

The affinities of *E. splendens* are unclear but it has been tentatively included with *E. aromaphloia* and its relatives. Although the morphology of its seedling stems and its fruit structure are unique within the group, on the basis of particular shared seedling and adult features, those taxa are regarded as being somewhat distant relatives. With regard to the manna gums, the fundamental differences in seedling development and morphology suggest an even more distant relationship.

SPECIMENS EXAMINED

VICTORIA: west of Mt Kincade, 29 km north-west of Portland, *A.C. Beaglehole* (MEL); 28.9 km from Portland towards Nelson by road, 29 Sep. 1992, *K. Rule 9273* (MEL); 22.2 km from Portland towards Nelson by road, 29 Sep. 1992, *K. Rule 9273* (MEL); 0.9 km west of Heath Road near Mt Kincade, 30 Sep. 1993, *K. Rule 9378* (MEL); The intersection of Heath Road and the Portland-Nelson Road, 2.4 km east of Mt Richmond township, Sep. 1993, *K. Rule 9379* (MEL); The intersection of Stephens Road and the Portland-Nelson, north-west of Portland, 30 Sep. 1993, *K. Rule 9382* (MEL).

KEY TO *EUCALYPTUS AROMAPHLOIA* AND ITS RELATIVES

1. New growth of seedlings waxy *Eucalyptus aromaphloia*
1. New growth of seedlings non-waxy.....2
2. Juvenile leaves lanceolate or ovate-lanceolate with upper surface lustrous and light green; seedling stems square in section and finely ridged *Eucalyptus splendens*
2. Juvenile leaves without the above combination of shape, lustre and colour; seedling stems round in section, rarely square, never finely ridged.....3
3. Juvenile leaves sessile for numerous pairs, linear and markedly falcate; fruits sessile or sub-sessile *Eucalyptus sabulosa*

3. Juvenile leaves petiolate, narrow-lanceolate or broader and non-falcate; fruits distinctly pedicellate
4. Canopy lustrous and green *Eucalyptus fulgens*
4. Canopy dull, grey-green.....4
5. Juvenile leaves lanceolate or ovate-lanceolate, grey-green; fibrous bark finely furrowed and thin *Eucalyptus iguorabilis*
5. Juvenile leaves narrow-lanceolate, blue-green; fibrous5
bark deeply furrowed, thick and spongy *Eucalyptus corticosa*

Notes on morphological variation within populations of *Eucalyptus aromaphloia*

Studies of populations of *E. aromaphloia* showed it to be a markedly polymorphic species. Several morphological forms have been identified, each of which exhibits a subtle or not so subtle distinctiveness in a range of characters.

The type locality of *Eucalyptus aromaphloia* is at the 113 mile post on the Western Highway near Buangor between Beaufort and Ararat. Here the trees are characterised by their somewhat lustrous, blue-green canopies, by their seedlings with waxy growth tips and juvenile leaves that are elliptical, grey-green, shortly petiolate and irregularly opposite, sub-opposite or alternate and by their subsessile, relatively large fruits (5-7 mm wide). This form is the most common and, although being variable in the colour and lustre of its canopy, in the width of its juvenile leaves and in its fruit morphology, accounts for the bulk of the populations of scentbark in west-central Victoria, including those along the Otway coast from Anglesea to near Port Campbell. In addition, there are a number of regional and morphological forms:

A forest form occurs along the Great Dividing Range in the vicinity of Creswick. It has broader juvenile leaves than typical (approaching sub-orbicular) and relatively large, slightly undulate adult leaves.

To the west of the type locality, in the vicinity of Moyston, is a form with a lustrous, appreciably green canopy and tightly clustered sessile fruits. In the field it resembles a manna gum.

Populations with green adult leaves and tightly sessile fruits also occur in low woodland communities in the vicinity of Anglesea. These populations also possess relatively broad juvenile leaves.

In the Black Range near Stawell and near Hall's Gap and Pomonal a form with narrow, conspicuously waxy juvenile leaves occurs on granite soils. Other populations with relatively narrow juvenile leaves occur on undulating terrain to the north-west of Mt Buangor. These have smaller fruits and narrower adult leaves than typical populations.

Populations with juvenile leaves of variable width occur along the Grampian's Mt William Range at an altitude of between 800 and 1000 m. They differ from typical populations in exhibiting lustrous, relatively coriaceous juvenile leaves rather than the dull, soft-textured ones of other forms. Further, these populations are often shrubby in habit, carry reduced amounts of rough bark and possess adult leaves that are markedly coriaceous, lustrous and relatively narrow. Fruits of this form are larger than most lowland forms.

Outlier populations occur on relatively dry slopes and ridges of the Pyrenees and St Arnaud ranges. These are small-fruited with small, blue-green or grey-green adult leaves and their juvenile leaves are within the typical range. In the Pyrenees Range, particularly on Mt Avoca, fruits have flattened discs and the St Arnaud Range trees exhibit a bark that is neat, shallowly furrowed and slightly tessellated in appearance.

Lastly, the most divergent form located so far occurs as a single, somewhat disjunct population on dry sedimentary slopes of the Fryers Range near Castlemaine in North-central Victoria. Its distinctive features include smaller adult leaves and fruits than typical and linear-oblong, markedly falcate juvenile leaves.

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References

- Briggs, J.D. and Leigh, J.H. (1989). *Rare and Threatened Australian Plants* Special Publication 14. (Australian National Parks and Wildlife Service: Canberra.)
- Boomsma, C.D. (1981). *Native Trees of South Australia*. Bulletin No 19. (Woods and Forest Department: Adelaide.)
- Chappill, J.A., Ladiges, P.Y. and Boland, D. (1986). *Eucalyptus aromaphloia* Pryor and Willis - A redefinition of geographical and morphological boundaries. *Australian Journal of Botany* 34: 395-412.
- Hill, K.D. and Johnson, L.A.S. (1991). Systematic studies in the eucalypts - 3, New taxa and combinations in *Eucalyptus* (Myrtaceae). *Telopea* 4(2): 223-267.
- Johnson, L.A.S. (1962). Studies in the taxonomy of *Eucalyptus*. *Contributions from the New South Wales National Herbarium*. 3(3): 103-126.
- Pryor, L.D. and Willis, J.H. (1954). A new Victorian (and South Australian) eucalypt. *The Victorian Naturalist* 71: 125-129.
- Pryor, L.D. (1955). The genetic and systematic status of *Eucalyptus huberiana*, *E. viminalis* Labill and *E. aromaphloia* Pryor & Willis. *Transactions of the Royal Society South Australia* 78: 156-164.
- Willis, J.H. (1973). *A Handbook to Plants in Victoria* Vol. 2. (Melbourne University Press: Carlton.)

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